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INTERPRETATING THE ACADEMIC RECORDS OF DISADVANTAGED STUDENTS.

STATE UNIV. OF N.Y., SYRACUSE,OFFICE OF ADMISSIONS

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A 10-YEAR LONGITUDINAL STUDY WAS UNDERTAKEN TO DETERMINE HOW CHANGE IS AFFECTED BY CURRICULUM, COMMUNITY, AND SCHOOL; AND BY THE STUDENTS' ABILITY, SEX, OUTSIDE ACTIVITIES, HOME LIFE, AND READING HABITS. IN 1961, A NATIONWIDE SAMPLE OF 32,000 CHILDREN IN GRADES 5, 7, 9, AND 11 TOOK A BATTERY OF TESTS. THERE HAVE BEEN PERIODIC RETESTINGS, TO BE COMPLETED IN 1969, JUST BEFORE THE ORIGINAL FIFTH-GRADERS FINISH HIGH SCHOOL. ALTHOUGH DESIGNED FOR PREDICTING HIGH SCHOOL GRADUATION RANK, THE STUDY MAY WELL APPLY TO COLLEGE PERFORMANCE. EMERGING PATTERNS INDICATE THAT EACH KIND OF DISADVANTAGEMENT HAS ITS OWN DISTINCT EFFECT. CERTAIN SETTINGS SO FRUSTRATE THE INTELLECT THAT THE STUDENT CANNOT SUCCEED IN COLLEGE. OTHERS, EQUALLY HOSTILE, TEACH HIM TO SURVIVE AND ADAPT TO COLLEGE IN A SUPERIOR WAY. OTHER FINDINGS CONCERN BIAS AND ITS DEFINITION, PREDICTIVE VALIDITY, THE SCARCITY OF DATA ON NEGRO-WHITE DIFFERENCES, THE FEW NEGROES IN INTEGRATED COLLEGES, AND THE IMPORTANCE OF COCURRICULAR ACTIVITIES. BY EXTENSION, THESE FINDINGS APPLY TO COLLEGE ADMISSION WITH A SIMILAR LIKELIHOOD OF PREDICTIVE SUCCESS. THE NATURE OF THE CULTURE IN "CULTURAL DISADVANTAGEMENT" IS IN NEED OF ANALYSIS AND RESEARCH. THIS SPEECH WAS PRESENTED AT A SYMPOSIUM SPONSORED BY THE OFFICE OF ADMISSIONS PROGRAM OF THE STATE UNIVERSITY OF NEW YORK (SYRACUSE, SEPTEMBER 30, 1965). (HH)

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Interpretating the Academic Records of Disadvantaged Students[1]

My part in today's program is to tell you about a research effort underway at Educational Testing Service, which we refer to as the Growth Study, and then to comment on what implications this research may have concerning the interpretation of the academic records of disadvantaged students. Let me anticipate these comments a little by warning you that so far our research has largely negative implications. By that I mean it suggests more of what should not be done than what should be done in interpreting students' records.

Let me also warn you that I am not an expert on college admissions. Except for a brief stint as an assistant dean of students my experience has been totally in teaching and research. I am hoping that this gives me license to be a little more irresponsible than most of you can afford to be. If you find that my remarks are out of touch with the exigencies of college admissions, you can discount them as spoken by a theoretician who seldom sees a college freshman.

First, let me quickly describe the Growth Study. This is a ten-year, longitudinal study of academic prediction and growth begun four years ago under the joint sponsorship of ETS and the College Board. Its general aim is to determine how academic change or growth varies with or is affected by characteristics of the school, the curriculum and the community and the characteristics and experiences of the students--their ability, sex, extracurricular activities, home background, reading habits, and leisure-time activities.

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[1]A talk presented at a symposium on "Admitting the Disadvantaged Student" sponsored by the Office of Admissions Program of the State University of New York, in Syracuse, N. Y., September 30, 1965.

In the fall of 1961, a nationwide sample of approximately 32,000 public and private school children were given a battery of tests requiring about ten hours of testing time. The sample included approximately 9,000 public school students in each of the fifth, seventh, and ninth grades and 5,000 in the eleventh grade and, in addition, approximately 1,000 private school students in the ninth grade and another 1,000 in the eleventh grade. The left hand vertical column of Figure 1 depicts this testing. One and a half years later, in the spring of 1963, the original eleventh graders were retested prior to their graduation from high school. And then, after their graduation, information was obtained from each high school in regard to their class standing and their post-high school career. The balance of the original sample were retested in the fall of 1963, two years after the original 1961 testing, and will be tested again this fall and again in 1967. Finally, in the spring of 1969, the remaining students (the original fifth graders) will be tested prior to their graduation from high school.

Note that we have not followed the students into college, nor do we have any immediate plans to do so. We do, however, think this would be a very desirable step and recently submitted a proposal to the Office of Education for support for such a continuation of the present study. Since we have not as yet followed the students into college, however, my qualifications as an expert on college admissions are even more suspect, but perhaps I can make up for this gap by drawing on some other research underway at ETS.

The initial battery of tests included the School and College Ability Tests (SCAT), six of the Sequential Tests of Educational Progress (STEP), and a specially designed Test of General Information. In 1963, the next higher level version of each of these tests was readministered to all but the original eleventh graders who took certain of the College Board tests. In addition, in

Figure 1

TESTING PLAN FOR THE STUDY OF ACADEMIC PREDICTION AND GROWTH

Grade	Sept.-Oct. 1961	Jan.-Feb. 1963	Sept.-Oct. 1963	Jan.-Feb. 1965	Sept.-Oct. 1965	Jan.-Feb. 1967	Sept.-Oct. 1967	Jan.-Feb 1969
5	TGI-L SCAT-5B STEP-4B N=8939							
7	TGI-L SCAT-4B STEP-3B N=8891		TGI-M BEQ-7 SCAT-4B STEP-3B N=8361					
9	TGI-M SCAT-3B STEP-3B N=9245		TGI-H BEQ-9 SCAT-3B STEP-3A N=8724		SCAT-3B STEP-3A N=7671			
11	TGI-H SCAT-2B STEP-2B N=5294		TGI-H BEQ-11 SCAT-2B STEP-2B N=7790		SCAT-2B STEP-2B N=7383		SCAT-2B STEP-2B N=6304	
12		BEQ-12 Am. Hist. Eng. Comp. PSAT N=4854		Am. Hist Eng. Comp. PSAT N=6750		Am. Hist Eng. Comp. PSAT N=5891		Am. Hist. Eng. Comp. PSAT N=5674
Total Ss per Administration	32,369	4,854	24,875	6,750	15,054	5,891	6,304	5,674

Note: The numbers of Ss indicated for the years 1965 to 1969 are estimates. These totals combine public and independent school counts.

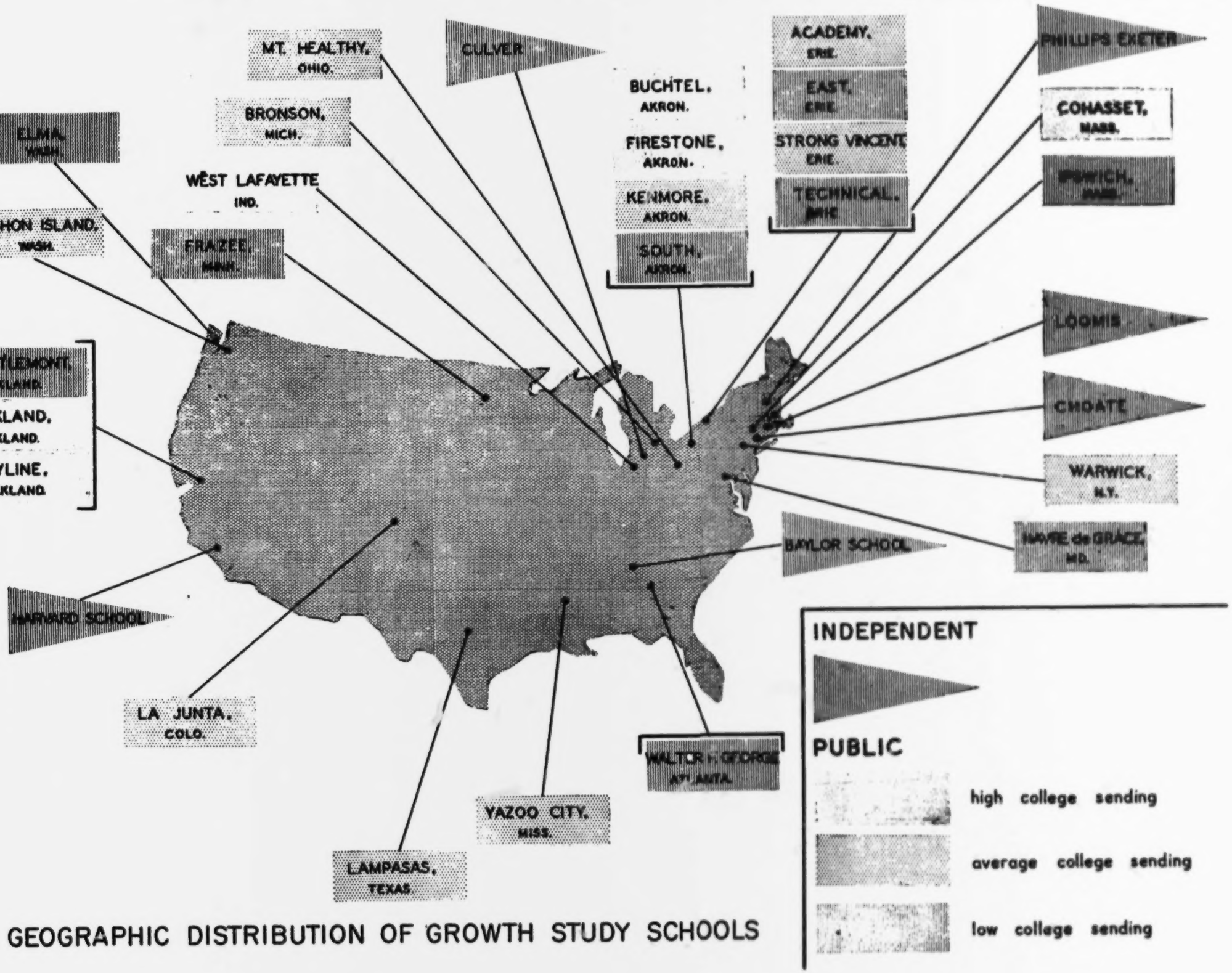
1963, a 25-page Background and Experience Questionnaire (BEQ) was given to all students, a slightly different version being used at each grade level.

The questionnaire provides an inventory of student activities and background factors related to academic growth. The background items focus on parents' education and occupation and certain characteristics of the student's home. The activities items emphasize behaviors over which a student has some choice. These behaviors are classified into two content categories (intellectual-aesthetic and social-physical) and three levels of skill (high, medium and low).

Seventeen public school systems and six private schools throughout the country are participating in this study. The participating schools are shown in Figure 2. As you can see, we have a fairly complete national coverage. The schools were selected so as to have a broad range in size, urban-rural location, geographical region and proportion of high school graduates who attend college.

The first four years of the project were devoted largely to planning, instrument development, data collection, and housekeeping. Only within the last year have we begun to analyze the data in an effort to answer some of the questions which the study was designed to answer. One of these has concerned the impact of cultural disadvantage on the academic development of the students.

When one starts to design research in the area of cultural disadvantage, the question of exactly what is meant by the term is soon encountered. Does it mean that the child is disadvantaged because he lacks cultural development, that is, because he has not achieved the cultural sophistication of his contemporaries? Or does it mean that the child is disadvantaged because of the culture in which he finds himself? What culture is it which places the child at a disadvantage? Is it something the child has, or something he has developed in, or something he has been deprived of?



GEOGRAPHIC DISTRIBUTION OF GROWTH STUDY SCHOOLS

Figure 2: Schools Participating in the Growth Study

As I pointed out in a symposium at the American Psychological Association meetings in Los Angeles last year, the child who grows up in Harlem is in one sense exposed to a very rich culture "From his daily wanderings, his neighborhood explorations, from the physical deprivations and emotional rejections of his home, his games with improvised equipment, his bouts with public authority, his street fights, gang membership with its elaborate rituals and sanctions--from all these experiences he rapidly acquires skills, traits, and values, some of which may even have middle class currency." Here I have in mind such traits as self-reliance, independence, resourcefulness, competitiveness, and resilience. His complex games and social actions may even result in accelerated development in certain cognitive functions as Piaget and Hunt have suggested. When, therefore, it is said that such children are disadvantaged, we obviously have something special in mind.

I think what we mean is that the child has not had the opportunity to acquire the habits, attitudes, values, goals, and manners of speech, dress, and deportment which are--what? Defined as middle class culture? Necessary for success in our contemporary schools? Displayed by the majority of the children in our schools? Displayed by your children and mine? Most conducive to intellectual growth? Let me return to these questions later.

Exactly what the antecedent conditions are which result in certain young people being disadvantaged are equally difficult to pin down. When you look at the research and ask, operationally speaking, exactly how was the particular disadvantaged group singled out, you encounter a variety of definitions. Frequently, <u>disadvantaged</u> is defined as residence in a particular area, precinct, school district, or neighborhood. Sometimes it is defined in terms of parental income or parental education. Or having a police record may qualify the youngster for inclusion in the disadvantaged group. In other research, having a language

handicap is the defining characteristic. And in others, being a member of a particular minority group.

Obviously these are not the same conditions nor do they have the same outcomes, nor is the psychological process connecting the antecedent conditions with the consequences the same. Furthermore--and this is most important for our present purposes--the prediction we would make about college performance is likely to differ depending upon the exact mix of characteristics displayed by the student and precisely what environmental forces impinge upon him.

What I am recommending is that we be very careful not to over-generalize in interpreting the academic credentials of students who appear on preliminary examination to have developed in a culturally deprived setting. Certain settings surely have so disrupted and frustrated the intellectual development of the student that he cannot succeed in higher education; but it is equally certain that certain other settings, perhaps hostile and depriving environments, have so well equipped students to survive and to adapt to the demands of higher education that they perform in a superior way.

The problem becomes one of trying to distinguish between the two cases. This pronouncement on my part comes as news to none of you. I wish I could give you some neat formulas for predictive purposes, but I cannot. I am reminded of a physical chemistry instructor I once had who was fond of saying that he didn't know any more than we did; the only difference between him and us was that his ignorance was more profound.

Let me now demonstrate further the profundity of my ignorance. One question that immediately rises when we examine the academic records of certain students is whether the test scores are valid. Do these scores provide an accurate index of the student's ability to perform well in college, or is there a bias in the test as far as the particular student is concerned?

We are now conducting a study under the sponsorship of the College Board of possible bias in the Scholastic Aptitude Test. In analyzing the problem for the purposes of the original proposal, we encountered--as in the case of cultural disdavantage--a semantic problem, namely, exactly what is meant by bias.

There are at least three possibilities. First is the possibility that the mean scores for a particular group are consistently lower than those of the general population. This can result from at least three circumstances. First, the intellectual skills of the group simply may not have developed as much as those of other young people. Second, the testing situation in general results in the students' in question generally performing less well. Perhaps this is because of the testing conditions, or the general attitude towards testing, or motivational factors, or simple lack of test-wiseness. The third circumstance is that a few items of the test are particularly difficult for them. In a study recently completed at ETS, for example, two items were identified which, because they required a knowledge of farm animals, were relatively difficult for students from urban areas.

These last two conditions are, I believe, what ordinarily is thought of as bias. But what if the students in the first case perform in college in an inferior way? In other words, both their test scores and their college grades are inferior. The test has then provided an accurate prediction of their performance. Is the test biased?

Or suppose the test scores of a particular group are no different from other groups with comparable education and background, but the college performance of this particular group falls far short of the performance predicted by the test. Is this bias or isn't it? The answer is a matter of semantics. In any case we have decided that the proper study of bias requires both an

examination of the item responses of the students in question and also an examination of the predictive validity of the test.

To check the predictive validity it is necessary to compare the regression equation for the group in question with that of other groups studying in the same learning environment. Because this has not been done in the research done to date, the results of that research are largely irrelevant. In the case of bias against Negro students it is necessary to find a large group of Negro students (at least 100) attending an integrated school where they have an equal opportunity to learn and where the test in question (in our case the SAT) is required for admission and where, ideally, grades are derived by means which are not subject to bias. We're still looking for such an ideal school, although we do have three somewhat less than ideal samples identified. If any of you know of one I would greatly appreciate hearing about it.

Our study is now in the data collection phase so I cannot report any results. But let me make a few preliminary observations. First, in developing plans for our study we examined a large number of studies of Negro-white differences in test performance. Let me summarize our impressions by saying that although there is evidence that certain types of tests and types of items are more difficult for Negro students than for other students we have been impressed by how little adequate evidence there is. Second, we have been impressed by the extent to which steps have been taken to expunge racial information from student records. The typical college now has no record whatsoever of the race of its students. Although we realize that this represents a kind of progress, we wonder how much the great difficulty researchers experience in identifying Negro students has contributed to the dearth of research in this area.

Third, we have been impressed by how few Negro students are actually attending integrated universities. Even those schools which described themselves to us as having "a great many" Negro students usually turned out to have a number which was less than 1% of its student body.

Let me now describe some studies we have recently completed which may have some implications for college admissions work. As shown in Figure 1, there was one group of students whom we tested at the beginning of their junior year, and then again a year and a half later in the spring before they were graduated from high school. These data enabled us to investigate a question which has interested us greatly, namely, whether background information contributes to the prediction of high school achievement over and above the prediction provided by objective tests administered at an earlier time. Another way of asking this question is as follows: Is there evidence in support of our taking into consideration the student's background and experiences when we predict his high school achievement? For the study we singled out the boys enrolled in college preparatory programs in the Growth Study schools throughout the country. Several other studies we have done indicate that in research of this kind it is important not to mix the sexes in one sample. We then subdivided the total sample into three large groups, according to the proportion of the graduates of each school who attend college. For the lowest schools less than 40% attend college, for the medium schools 40-60%, and for the high it is more than 60%. The "low" category includes a substantially higher proportion of students who would ordinarily be described as "disadvantaged" although the students in these schools are by no means uniformly so. The mean scores for the boys in these schools are shown in Table 1. First, the mean STEP and SCAT scores are listed. There are clear differences for these tests; the standard deviation for these tests is roughly ten points so for certain of them there is a

difference of almost one standard deviation between the mean for the students who attended the low college-sending schools and the students at the high college-sending schools.

Similarly the mean scores on the various scales of the Test of General Information, and the SAT and College Board Achievement tests are lower for the low schools. These findings are not surprising, although I would be hard put to explain exactly why this state of affairs has come about. Is it, for example, because the schools in certain communities draw on students who are inherently less able than the students in other communities? Or is it that the academic program over the years has for certain school systems been such that the skills and achievements of the students have not had an opportunity to grow at the same rate as other students? From another study which we recently conducted using Growth Study data, we obtained evidence that even when adjustments are made for the differences in the skills and achievements of the students at the time they entered the school, there are schools which simply do not contribute as much to the intellectual growth of the students as other schools. In other words, some schools simply are better than others.

Another possibility is that the habits and activities of the students may account for their lower achievement. This is suggested by the next group of variables listed in Table 1. Note that TV watching was divided into low and high levels. The low category included those programs designed primarily for entertainment: westerns, serials, musical variety shows; the high category included documentaries which were judged as making more intellectual demands on the viewer than the others. (All of the programs which I regularly watch were classified as low.) Similar classifications were made of various non-school activities the students engaged in and of their reading. From these means it appears that the students attending the low schools not only watch

Table 1

Mean Scores for Students in Schools Grouped by

Proportion of Graduates Who Attend College

		Low[a] N = 205	Medium N = 442	High N = 559
1	STEP Mathematics	283.7	287.3	290.2
2	STEP Science	287.0	290.3	291.5
3	STEP Social Studies	282.9	287.9	289.4
4	STEP Reading	296.3	299.8	300.7
5	STEP Listening	297.5	298.9	301.8
6	STEP Writing	289.2	292.8	297.0
7	SCAT Verbal	286.7	289.3	292.2
8	SCAT Quantitative	301.7	306.2	309.3
9	SCAT Total	293.3	296.5	299.4
10	TGI Industrial Arts	8.5	9.4	9.2
11	TGI Home Arts	8.1	8.4	9.0
12	TGI Physical Education	9.0	9.1	10.0
13	TGI Biological Science	9.6	10.2	10.1
14	TGI Music and Art	8.1	8.3	9.4
15	TGI History-Literature	9.3	10.0	10.5
16	TGI Entertainment	10.0	10.1	10.8
17	TGI Public Affairs	8.6	9.0	9.2
18	TGI Total	71.2	74.6	78.0
19	SAT Verbal	404.5	428.4	465.9
20	SAT Mathematical	474.6	507.9	539.4
21	CEEB English Composition	380.1	402.8	436.3
22	CEEB American History	428.0	458.3	477.1
23	Rank in Class	53.4	52.4	51.9
24	Urban (2) or Non-urban (1)	1.7	1.6	1.8
25	% Attending College	1.0	2.0	3.0
26	Size of School	2.1	2.3	2.7
27	Amount of low level TV watching	15.6	15.4	13.8
28	Amount of high level TV watching	6.6	6.2	6.3
29	Time spent in low skill activities	13.4	13.8	12.8
30	Time spent in medium skill activities	10.4	10.7	9.7
31	Time spent in high skill activities	4.1	3.4	3.6
32	Amount of low level reading	3.5	3.8	3.4
33	Amount of medium level reading	6.7	7.3	7.0
34	Amount of high level reading	4.7	4.6	5.2
35	Amount of homework done	2.9	2.6	2.9
36	Amount of part-time or summer work	7.3	7.1	6.5
37	Level of occupational plans	6.6	6.8	7.0
38	Parents' education	7.4	7.7	9.1
39	House-Home Index	4.0	4.1	4.4
40	Interest in English	5.2	5.1	5.2

		Low[a] N = 205	Medium N = 442	High N = 559
41	Interest in Social Studies	5.2	4.9	5.1
42	Interest in Mathematics	5.2	5.4	5.2
43	Interest in Science	5.1	5.3	5.2
44	Interest in Languages	4.1	3.9	3.9
45	Summary of academic interests	24.9	24.5	24.7
46	Summary of non-academic interests	14.5	13.6	14.6
47	Amount of thought on various subjects	6.4	6.4	6.4
48	Time spent talking to friends	7.6	7.8	7.9
49	Time spent talking to parents	6.3	6.6	6.6
50	Time spent talking to counselor	3.8	3.7	2.9
51	Time spent in home activities	3.2	3.0	2.9
52	Time spent on mechanical things	2.6	2.9	2.5
53	Time spent on science at home	2.6	2.6	2.7
54	Time spent on art work at home	7.8	6.9	7.6
55	Time spent on current affairs	8.3	8.6	9.0
56	Time spent on entertainment	17.9	18.5	16.7
57	Summary of academic activities	18.7	18.1	19.3
58	Summary of non-academic activities	23.6	24.5	22.1
59	Summary, English and History	808.0	861.2	913.4
60	Summary, Verbal and Math	879.0	936.4	1005.3
61	Summary, 59 and 60	1687.1	1797.5	1918.7
62	Summary, 61 and Rank in Class	2221.3	2321.8	2437.9

[a]Refers to the % of 1960 graduates who attended college -- Low = 0-40%, Medium = 40-60%, and High = > 60%.

more low-level TV, but also more high-level TV, and furthermore that they spent more time in non-school activities.

The results for reading are mixed, and also for amount of homework done. From variable 36 we see that the students in the "low" schools engage in more part-time or summer work and have slightly less ambitious occupational plans. Their parents have substantially less education, on the average. The scoring on the education item was such that a mean score of eight would mean that the parents in the sample were, on the average, high school graduates. A mean score of nine means that the parents, on the average, had some college or post-high school education.

The House-Home Index is a measure of socioeconomic status.

The interest questions and the time utilization questions by and large do not discriminate among the groups, except for the questions concerning time spent talking to counselors.

Before leaving these particular results, let me remind you that the boys in question are all enrolled in academic programs. When the total student body of the three types of schools are compared, the differences are more dramatic, but for college admissions purposes, we ordinarily are concerned only with the students in academic programs. This is the reason these students are singled out here.

Thus, there are some reliable differences among the students attending schools with different proportions of students who attend college. The real question is: do these differences have any real significance in terms of performance in college? Unfortunately, we cannot answer this question from these data. We did, however, look at the relationship between these variables and each student's rank in his graduating high school class.

To evaluate the contribution to prediction of each variable, we computed stepwise multiple regression coefficients. These are depicted in Figure 3. Notice there are six vertical lines, three for the students from high college-sending schools and three for the students at low college-sending schools. In the two left-hand predictions, we asked how well the biographical scores alone predicted rank-in-class. We see that the variable labeled "Level of occupational plans" which is shown in the lower left-hand corner all by itself has a correlation of about .34 with rank-in-class. In other words, the high ranking students tended to aspire to higher level occupations.

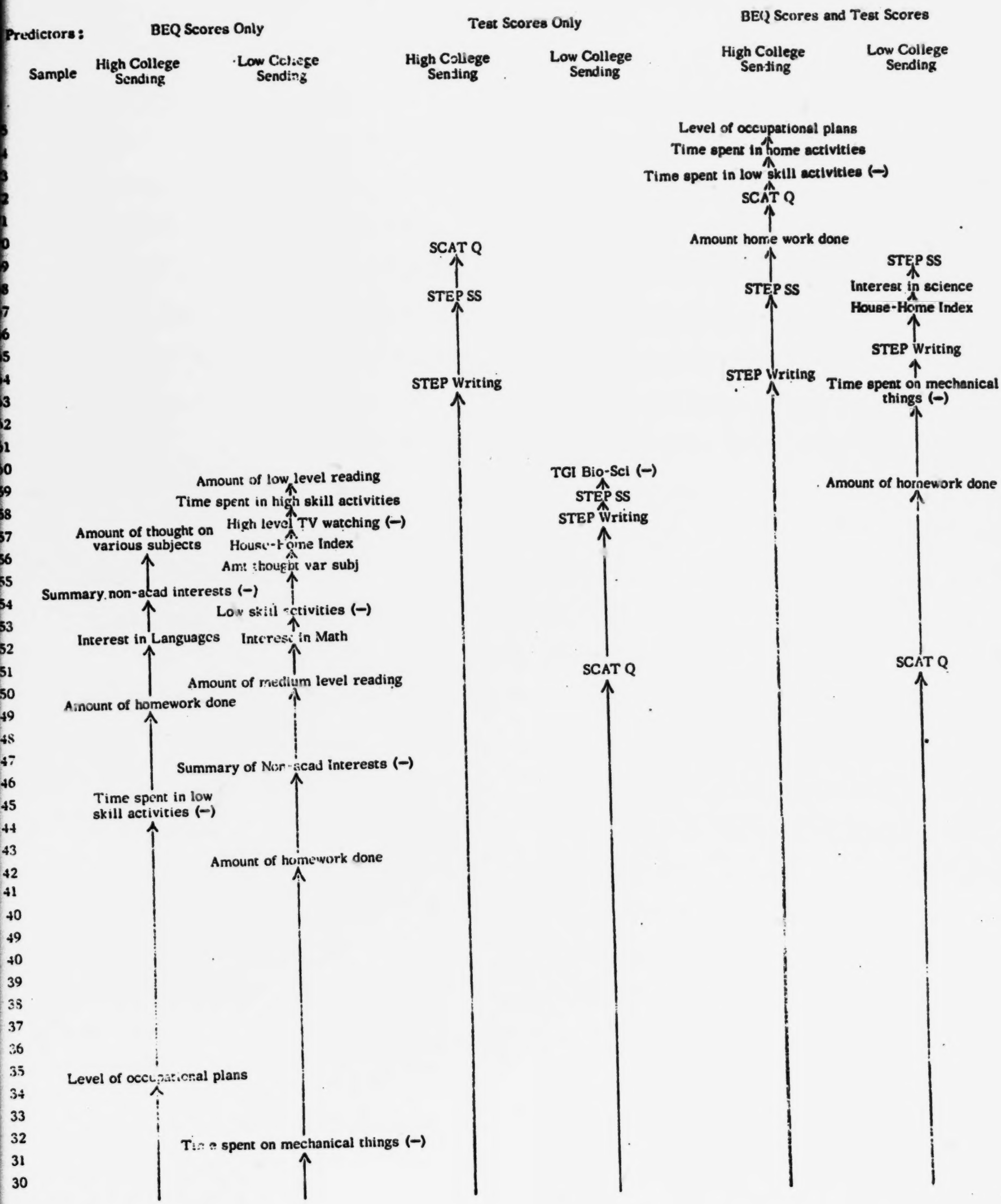
Next we see that if we add a variable which we refer to as "Time spent in low skill activities" this increases the multiple prediction to .44, but notice the negative sign in parentheses. This means that this variable has a negative weight. In other words, the more time students report they spent in low skill activities, the lower their high school rank-in-class when predicted jointly from occupational plans and "Time spent in low skill activities." And then on to "Amount of homework done" and "Interest in languages", then the summary score of "Non-academic interests" (again, with a negative weight) and finally the amount of thought the student reports he gives to various subjects.

All of that is for the students attending high college-sending schools. Look now at the set of arrows next to the one I have just been describing. This set of arrows is for the students attending low college-sending schools. Generally speaking, we find the same variables emerging as significant, although their order is different, and there are a few new ones. "Interest in mathematics" emerges as contributing to the prediction whereas for the high college-sending students "Interest in languages" contributed.

We also see "Amount of reading done" emerging as a significant predictor. Even "Amount of low level reading" adds a final one point to the prediction.

Figure 3

Stepwise Multiple Regression Prediction of 12th Grade Rank in Class



One gets the impression that the important thing is that a student read even if at a low level, although such a conclusion would rest on a pretty thin reed. As you know it is very risky to draw inferences about what constitutes a good educational experience from correlational data.

The pair of vertical lines in the center of the page represents the correlations obtained when we look only at test scores as predictors. For the high college-sending students the STEP Writing Score was the single best predictor, whereas for the low college-sending students SCAT Quantitative score was the best single predictor. (I should point out that this particular statistical technique is such that the highest correlation is picked out; a difference between the chosen correlation and the next highest correlation may have been very small indeed. Thus, for the low college-sending students the difference between the correlations of SCAT Quantitative with rank-in-class and STEP Writing and rank-in-class may have been only one or two points.)

In the last two columns on the right we have thrown both test scores and background scores into the hopper. When we do this, we see that test scores carry most of the weight. For the high college-sending students only "Amount of homework done" contributes as much as any test score. For the other group "Amount of homework done" and "Time spent on mechanical things" make the grade, so to speak.

Keep in mind that in this analysis we were predicting rank in high school graduating class, not college performance. But nevertheless the findings suggest some conclusions which may well apply to college performance. What you do to predict the college performance of students from low college-sending schools is probably different from what you do to predict the performance of students from high college-sending schools, in the same way that the variables

and their weights differed in the prediction of high school rank in class which we just described.

How the predictive equations will differ I cannot say. To the best of my knowledge the research required for such evidence simply has not been done, probably for the same reason that we have found the data for our Test Bias study so difficult to obtain. In order to do this study, you would have to identify two groups of students such as those I have just described--that is, one group attending a low college-sending high school and another group attending a "high" school--all of whom subsequently attended the same university. (If the students attended a variety of universities, then grading standards, curricula, and the academic environments would probably differ so much that it would be impossible to obtain an applicable measure of college performance.)

I could be mistaken about this absence of research. Relevant studies tend to be done in this area, perhaps by some of you, without being published. If any of you know of such studies, would you please pass the information along to me.

Earlier I left open several questions concerning the nature of the culture referred to in the expression <u>cultural disadvantage</u>. It should be clear now that I still regard them as unanswered questions which sorely need philosophical analysis and empirical research.

In conclusion what can I say about the problem of interpreting the records of disadvantaged students. The one thing which seems most clear is that it will be a long time before computers replace admissions officers. There still is no substitute for wisdom, insight, careful weighing of attributes, and judicious gambling.